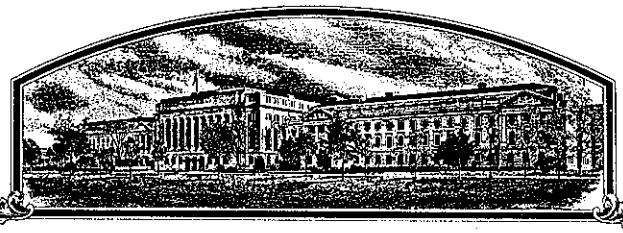
No. 8400014



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Nickerson American Plant Breeders, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT ETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT 'Buckshot'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 31st day of January in the year of our Lord one thousand nine hundred and eighty-six.

Attest:

Kenneth O. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Acting Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
HS79-561	Buckshot	PV NUMBER 8400014
2. KIND NAME: Hard Red Spring Wheat	3. GENUS AND SPECIES NAME: Triticum aestivum L.	FILING DATE 11-14-83 / TIME 2:30 A.M. P.M.
4. FAMILY NAME (BOTANICAL): Gramineae	5. DATE OF DETERMINATION 1) March 1979 2) March 1981	FEE RECEIVED $ 1,000 / $ ____ / DATE 11/14/83

6. NAME OF APPLICANT(S)	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)	8. TELEPHONE AREA CODE AND NUMBER
NICKERSON ~~North~~ American Plant Breeders, Inc.	5201 Johnson Drive, P.O. Box 2955 Mission, KS 66201	913-384-4940 KS 303-532-3721 CO

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Delaware, January 19, 1983	1/19/83

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:

~~G.E. Dixon~~ R.E. HEINER
P.O. Box 2955
Mission, KS 66201

~~R.E. Heiner~~ ROGER F. BRUNS or C. Bruns
P.O. Box 30
Berthoud, CO 80513

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.
- [X] 13E. Exhibit E., Quality Data and Statistical Data.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[X] YES [ ] NO	[X] FOUNDATION [X] REGISTERED [X] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

27 October 1983 (DATE) — Robert E Heiner (SIGNATURE OF APPLICANT)

30 October 1983 (DATE) — (SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

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8400014

EXHIBIT A.

Origin and Breeding History of Buckshot

Pedigree: Waldron/Era/3/Angus//Ciano/Tezano Pintos Precoz

History: The F_2 population was obtained from the University of Minnesota in 1977. Buckshot originated from a single F_3 head selection in 1978. An F_4 bulk of this selection was first entered into yield trials in 1979 under the experimental number HS79-561. This line has been in wide scale testing throughout the spring wheat region of the upper Midwest during the 1980 through 1983 seasons.

Two hundred seventy-two heads were pulled from the F_5 generation of the original bulk in the 1980 season. These were grown in head-rows for initial purification at Berthoud, Colorado in 1981. Of these, four rows (1.5%) were discarded due to earlier heading and three rows (1%) were discarded due to taller height. In the 1982 season, the remaining bulked head-rows were grown to produce the breeder seed lot.

Buckshot is uniform and pure. Less than .5% of the plants have been rogued from the breeder seed field in 1982. Ninety-five percent of these rogued plants were three to five centimeters taller than Buckshot. Less than .05% of these taller plants may be expected in subsequent generations.

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EXHIBIT B.

NOVELTY STATEMENT

Buckshot is most similar to the hard red spring wheat Era. However, it can be distinguished on the following morphological characteristics:

- Buckshot has a round shoulder shape. Era has an oblique shoulder shape.

- Buckshot and Era differ significantly in head length (see Exhibit E., page 2).

- Buckshot and Era differ significantly in leaf length (see Exhibit E., page 3).

- Buckshot and Era differ significantly in leaf width (see Exhibit E., page 4).

- Buckshot and Era differ significantly in height (see Exhibit E., page 5).

- Buckshot is two days earlier maturing than Era (see Exhibit C., Item 4).

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Anova Table for Head Length

Buckshot versus Era

Source	df	ss	ms
Total	49	82.42	
Variety	1	57.03	57.03**
Error	48	25.39	.53

** There is significant difference between head length when compared at both the 5% and 1% alpha level.

Variety	Mean Length
Buckshot	8.58 cm
Era	6.45 cm

F Test = 107.60**
LSD (.05)= .414

8400014

Anova Table for Leaf Length

Buckshot versus Era

Source	df	ss	ms
Total	48	257.55	
Var	1	23.90	23.90*
Error	48	233.65	4.87

Variety	Mean (cm)
Buckshot	26.1
Era	24.8

F test = 4.91*
LSD (05)= 1.2
LSD (01)= 1.7

* In this test there is a significant difference in leaf length between Buckshot and Era at the 5% level only.

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Anova Table for Leaf Width

Buckshot versus Era

Source	df	ss	ms
Total	49	128.18	
Var	1	30.43	30.43**
Error	48	97.75	2.04

Variety	Mean (mm)
Buckshot	14.4
Era	12.8

F test = 14.92**
LSD (05)= 0.8
LSD (01)= 1.1

** In this test there is a significant difference in leaf width between Buckshot and Era at the 5% and 1% levels.

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Anova Table for Height

Buckshot versus Era

Source	df	ss	ms
Total	27	2506.68	
Var	1	789.68	789.68**
Error	26	1717.00	66.03

F test = 12.0**
LSD (.05)=4.47

Variety	Mean
Buckshot	77.3 cm
Era	72.4 cm

In this test there is a significant difference between varieties at both the 5% and 1% levels.

- Data representing 14 observations from the Midwest —

Buckshot

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
~~North~~ American Plant Breeders Inc.
NICKERSON

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
5201 Johnson Drive, P.O. Box 2955
Mission, KS 66201

FOR OFFICIAL USE ONLY
PVPO NUMBER 8400014

VARIETY NAME OR TEMPORARY DESIGNATION
BUCKSHOT

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

[1] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____ [2] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) _____

3. SEASON - NUMBER OF DAYS FROM [redacted] TO:

planting

[0][8][3] FIRST FLOWERING [0][8][8] LAST FLOWERING

4. MATURITY (*50% Flowering*):

[0][2] NO. OF DAYS *EARLIER* THAN ..... [7] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[0][1] NO. OF DAYS *LATER* THAN ..... [3] 4 = LEMHI 5 = NUGAINES 6 = LEEDS 7=Era

5. PLANT HEIGHT (*From soil level to top of head*):

[0][7][7] CM. HIGH

[0][5] CM. TALLER THAN ..... [7]

[2][5] CM. SHORTER THAN ..... [3] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS 7=Era

6. PLANT COLOR AT BOOTING (*See reverse*):

[2] Head color blue-green at anthesis
1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE

8. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom: 1 = ABSENT 2 = PRESENT

[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[0][4] NO. OF NODES (*Originating from node above ground*)

[2][5] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

[2] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____

[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[1][5] MM. LEAF WIDTH (*First leaf below flag leaf*)

[2][6] CM. LEAF LENGTH (*First leaf below flag leaf*)

FORM LPGS-470-6 (7-81) (Edition of 3-79 may be used)

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Buckshot

8400014

FORM GR-470-6 (REVERSE)

11. HEAD:

[3] Density: 1 = LAX 2 = DENSE 3=Middense ave. 50 mm

[2] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[1] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[8.8] CM. LENGTH [11] MM. WIDTH

12. GLUMES AT MATURITY:

[2] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.) Ave. 7.75 mm

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.) Ave. 3.9 mm

[3] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE Ave. 4.8 mm

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[2] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = midlong 3 = LONG

[2] Brush: 1 = NOT COLLARED 2 = COLLARED

[5] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[6.2] MM. LENGTH [3.3] MM. WIDTH [43] GM. PER 1000 SEEDS

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3=moderately susceptible 4=moderately resistant

[2] STEM RUST (Races) _____ [4] LEAF RUST (Races) _____ [0] STRIPE RUST (Races) _____ [0] LOOSE SMUT

[3] POWDERY MILDEW [0] BUNT [0] OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3=moderately susceptible 4=moderately resistant

[0] SAWFLY [0] APHID (Bydv.) [0] GREEN BUG [0] CEREAL LEAF BEETLE

[0] OTHER (Specify) _____ HESSIAN FLY RACES: [0] GP [0] A [0] B [0] C [0] D [0] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Era	Seed size	Era
Leaf size	Era	Seed shape	Era
Leaf color	Era	Coleoptile elongation	Era
Leaf carriage	Era	Seedling pigmentation	Era

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

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EXHIBIT D.

ADDITIONAL DESCRIPTION OF BUCKSHOT

Buckshot is a hard red spring wheat developed by North American Plant Breeders Inc.. It was tested as the experimental number HS79-561.

Buckshot is a medium height semidwarf variety with good straw strength and a midseason maturity. Milling and baking qualities are medium. Its protein and baking absorption levels are slightly higher than Era; its loaf volume slightly lower also.

Juvenile plant growth habit is semi-erect. Plant color at boot is dark green with a blue-green head at anthesis. Flag leaf is twisted and recurved. Head shape is strap to tapering, middense, awned and head color is white at maturity. Glumes are medium in length and wide in width at maturity with rounded to oblique shoulders and acuminate beaks. Seed shape is ovate with rounded cheeks. Seed crease width is narrow and depth is shallow. Brush size is midlong to short and embryo size is large.

Buckshot is adapted to the northern spring wheat region of North Dakota, South Dakota and Minnesota. It also has performed well under irrigation in the spring wheat areas of Colorado.

YEAR: 1982

North American Plant Breeders

HARD RED SPRING WHEAT QUALITY

YEAR	SAMPLE NAME	LOC	WHEAT--FLOUR QUALITY: TEST WT.	WHT PROT	FLR YLD	FLR PROT	FLR ASH	MIX CURVE	BAKING QUALITY: ABS.	MIX TIME	DOUGH CHAR	LOAF VOL	CRUMB GRN	CRUMB TEX	CRUMB COL	MILL SCORE	BAKE SCORE	TOTAL SCORE
			lb/Bu	14%mb	%	14%mb	14%mb	R	%	min	R	cc	R	R	R			
79	HS79-561	HU	60.8	11.4	74.4	9.9	0.453	4	57.0	3.5	6	890	7	7	9	60-D	70-C	130-D
79	HS79-561	CY	61.3	14.3	73.5	12.1	0.373	7	65.0	3.5	7	960	7	7	9	85-B	88-B	173-B
80	HS79-561	HU	58.9	14.8	73.6	12.6	0.398	5	60.0	4.0	7	930	7	8	9	81-B	78-C	159-C
81	HS79-561	CR	57.4	13.7	68.0	12.1	0.465	6	63.0	3.5	8	880	8	8	8	71-C	83-B	154-C
81	HS79-561	HU	58.5	14.9	67.7	12.9	0.455	7	64.0	3.8	8	930	8	9	9	75-C	90-A	165-B
81	HS79-561	CY	59.8	12.5	71.9	11.0	0.432	6	61.0	3.3	8	950	8	7	8	72-C	80-B	152-C
82	HS79-561	CR	60.1	14.1	70.4	13.0	0.437	6	64.0	3.0	9	890	8	8	9	82-B	85-B	167-B
82	HS79-561	CY	62.6	13.5	72.2	12.9	0.427	6	63.0	2.8	8	930	8	9	9	82-B	83-B	165-B
82	HS79-561	HU	59.5	14.3	70.4	12.7	0.409	4	62.0	3.3	8	850	8	9	9	75-C	81-B	156-C
	AVERAGE		59.7	13.7	71.3	12.1	0.428	6	62.1	3.4	8	919	8	8	9	79-C	82-B	161-B
79	ERA	HU	57.4	13.5	73.3	11.9	0.460	8	64.0	4.5	8	1000+	7	7	9	81-B	89-B	170-B
79	ERA	CY	62.5	12.3	74.7	11.0	0.397	8	62.0	5.0	8	1000+	7	7	9	78-C	83-B	161-B
80	ERA	HU	60.3	13.3	73.8	11.2	0.450	4	56.0	4.0	7	775	6	6	9	70-C	65-D	135-D
81	ERA	CR	57.2	12.6	70.4	10.9	0.526	3	62.0	4.8	8	980	7	7	8	62-D	82-B	144-C
81	ERA	HU	56.8	15.8	66.7	13.9	0.563	8	66.0	4.3	8	1000+	8	8	9	78-C	93-A	171-B
81	ERA	CY	60.0	12.6	70.6	10.8	0.451	5	61.0	5.0	9	940	8	7	8	66-D	79-C	145-C
82	ERA	CR	61.4	13.5	72.3	11.4	0.436	6	62.0	3.8	8	950	8	8	9	77-C	86-B	163-B
82	ERA	CY	61.7	13.5	73.8	11.9	0.452	6	63.0	4.3	9	960	7	8	9	79-C	87-B	166-B
82	ERA	HU	58.8	14.2	70.7	12.8	0.423	4	60.0	5.0	8	1000+	8	9	9	74-C	83-B	157-C
	AVERAGE		59.6	13.5	71.8	11.8	0.462	6	61.8	4.5	8	978	7	7	9	77-C	83-B	160-B

GRADES: A-EXCELLENT B-GOOD C-ACCEPTABLE D-QUESTIONABLE F-UNACCEPTABLE

R=RATINGS: 9-10=EXCELLENT 8=GOOD 7=ACCEPTABLE 5-6=QUESTIONABLE 1-4=UNACCEPTABLE

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